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John F. Kennedy Space Center

CAIB Report released - - NASA will comply

The Columbia Accident Investigation Board (CAIB) presented its final report on the causes of the Feb. 1 Space Shuttle accident to the White House, Congress and NASA on Aug. 26. The CAIB report concludes that while NASA's present Space Shuttle is not inherently unsafe, adjustments are required to make the Shuttle safer in the short term.

NASA Administrator Sean O'Keefe and Kennedy Space Center Director Jim Kennedy immediately responded to the report.

"On the day of the Columbia tragedy, NASA committed to the families of STS-107's crew that we would find the problems that caused this horrible accident, fix them, and return to the exploration objectives their loved ones dedicated their lives to," O'Keefe said. "Today, we have completed the first phase of that important commitment.

"The efforts of all concerned with the investigation will help NASA improve the Space Shuttle

program, our management processes, and our capability to safely return to flight. The findings and recommendations of the board will serve as NASA's blueprint. We have accepted the findings and will comply with the recommendations to the best of our ability.

"The board has provided NASA with an important road map, as we determine when we will be 'Fit to Fly' again. Due to the comprehensive, timely and open public communication displayed by the Board throughout the investigative process, we already have begun to take action on the earlier issued recommendations, and we intend to comply with the full range of recommendations released today."

KSC has already begun to address CAIB recommendations. For example, to support the newly designed heaters for the external tank bipod modification, engineers have initiated the redesign of the ground support equipment and launch process-



"We understand that things have to change," said KSC Director Jim Kennedy in response to the Columbia Accident Investigation Board's final report.

ing system software supporting it. This ensures that when the external tanks are on the launch pad, the new heaters will work with the ground equipment.

At the same time, employees have addressed the way foreign object debris (FOD) is labeled. Previously, there were different

categories of FOD; now there is just one FOD category. All FOD reports will be given the same attention until a solution for each issue is realized.

"This KSC work force stands ready to the challenge ahead,"

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One NASA team discusses collaboration

"I think One NASA is all about teamwork. Regardless if you're NASA badged or part of the contractor team, you're part of the NASA team," said Center Director Jim Kennedy. With those words, Kennedy helped inaugurate the Agency's One NASA leader-led workshops Aug. 20.

NASA is embarking on a cultural change emphasizing a strong commitment to teamwork, accessible tools and a greater collaboration across the Agency. This forward-thinking leap, which also meets the President's

(See ONE NASA, Page 6)



The One NASA panel includes (from left) Jim Kennedy, KSC director; James Jennings, associate deputy administrator for Institutions and Asset management; Ed Weiler, associate administrator for Space Science; Kevin Peterson, Dryden Flight Research Center director; incoming KSC Deputy Director Woodrow Whitlow; and implementation team lead Johnny Stephenson. The group convened in the IMAX II Theater at the KSC Visitor Complex.



Jim Kennedy
Center Director

The Kennedy Update

It's been 10 days since the Columbia Accident Investigation Board released its report. After having a chance to read the report and understand the CAIB's recommendations, I believe it's wise to pause and reflect on what the board said as our Agency prepares to unveil its first draft of a Return To Flight (RTF) Implementation Plan next week.

The RTF Implementation Plan is the document NASA will continually update to demonstrate our intentions to comply with the CAIB's recommendations.

As our Administrator Sean O'Keefe stated, we accept the board's recommendations without reservation. The time for

debate on their findings is over; it's now time to pick the best options possible to comply with the recommendations.

The CAIB found the problems. We're going to fix them and return to flight when we're fit to fly!

I have no doubt the technical problems of returning to flight, while difficult to accomplish, will be solved and our human space flight journey will continue. But while the technical aspects are critically important, we must be diligent to work the organizational and cultural issues the CAIB identified as well.

As Sean O'Keefe said in his NASA Update on the day of the CAIB release, "I would suggest

that we update those words (of Gene Kranz), that we indeed also adopt the principle of "tough and competent," and that each day when we enter and we do what we do throughout this Agency, every single one of us ought to be reminded of the price paid by Husband, McCool, Anderson, Clark, Chawla, Brown and Ramon. These words, "tough and competent," are the price of admission to the ranks of NASA, and we should adopt it that way."

Each and every one of us should adopt the principle of tough and competent as the only way we can do business. The unforgiving nature of space flight demands it. The memories of Apollo 1, Challenger and Columbia make it a professional and moral obligation.

As I've stated before, the KSC work force is the right people, in the right place, at the right time in history to bring the Shuttle program back stronger and better than ever. If I didn't believe that, I would leave the Agency today.

For my part, I pledge to you that during the return to flight journey, every voice will be heard and every legitimate idea explored as we find the solutions that return us successfully to

flight. People should not feel inhibited from speaking their mind or calling "time out" if something in their heart is telling them, "This just isn't right."

I need everyone to be the "eyes and ears of success" to ensure great suggestions have a chance to mature into great solutions and not be thrown on the "I should have said something" scrap pile of history.

Leadership comes at all levels, not just from the top. The person on the line dealing with hardware is as important a leader as anyone who drives through our gates, including myself.

We will only succeed if we all work together to show tough and competent leadership during the months leading up to launching STS-104/Atlantis as early as spring of 2004.

I know we are up to the task. The nation is counting on us and I can't think of a better place to come to work every day than right here at KSC.

Thank you for all your dedicated and committed efforts to the return to flight journey as well as the other critically important work we do for NASA. I appreciate you giving me a moment of your time.

COLUMBIA . . . (Continued from Page 1)

Kennedy said. "Let no one misunderstand we have a great challenge ahead. I have been at this Center for nine months but I can tell you that never have I worked with an organization that I take this much pride in. We understand that things have to change.

"We understand that for the safety of flight, for the future astronauts that will fly on the Shuttles, we must do business differently. We will stay focused on our number one objective of safety, and we will embrace change.

"For example, we're ensuring our mandatory inspection points have the right NASA oversight. We're strengthening the way we document and track in-flight anomalies.

"I'm proud to tell the world I have full faith and confi-

dence in the KSC workforce. I know you join me in an unwavering commitment to returning the Shuttles safely to flight."

The report, which consists of 11 chapters, was the result of a seven-month investigation by the CAIB's 13 board members, more than 120 investigators, 400 NASA and contractor employees and more than 25,000 searchers who recovered Columbia's debris.

Over the next several weeks, the board expects to publish several volumes containing technical documents cited in the report.

The board crafted the report to serve as a framework for a national debate about the future of human space flight. The board makes 29 recommendations in the 248-page report, including 15 return-to-flight recommendations that should be implemented before the Shuttle Program returns to flight. The report can be viewed at: www.nasa.gov.



NASA's Space Infrared Telescope Facility (SIRTF) successfully launched from Cape Canaveral Air Force Station at 1:35 a.m. EDT Aug. 24 aboard a Delta II Heavy launch vehicle. The new observatory entered an Earth-trailing orbit, the first of its kind, approximately 43 minutes after launch. SIRTF will use infrared detectors to pierce the dusty darkness around many of the universe's most fascinating objects.

STARS flight tests tracking methods

A more effective, economical tracking and communication technology recently took flight.

The Space-based Telemetry And Range Safety (STARS) flight demonstration is one in a series of eight tests comprising Flight Demonstration 1. The tests demonstrate the capability to utilize existing space-based platforms such as the Tracking and Data Relay Satellite System (TDRSS) and Global Positioning System (GPS) to provide reliable communication, telemetry and tracking for range safety and range users.

Range safety support includes flight termination processing from both space and ground assets and vehicle tracking. Range user support includes high return-link data rates for voice, video and vehicle/payload data.

STARS' methods surpass existing ground-based systems for maintaining tracking and communication with space launch vehicles. According to STARS Project Manager Lisa



The STARS flight team included (from left) Rodger Romans, Erik Denson (KSC), Robert Sakahara, Bob Sliko, Don Whiteman, Lisa Valencia (KSC), Rich Nelson (KSC), David Bowles, Don Borchers and Darryl Burkes

Valencia, current practices are outdated, and very expensive to operate and maintain, and estimates show that using these new methods could reduce costs by up to \$40 million per year.

Valencia explained that this was a "high dynamics" flight with STARS hardware and antennas located in the aircraft. "The F-15B aircraft did rolls, loops, turns, cloverleaves, push-over-pullups, went straight up

while doing a roll, and more," she said. "Some of the other tests are straight and level or short in duration. These dynamic maneuvers will help determine antenna coverage."

While the hour-plus flights occur at NASA Dryden Flight Research Center (DFRC), STARS work, which supports Next Generation Launch Technology (NGLT), is managed by Kennedy Space Center. DFRC provides the

aircraft, the range, the control room and the range user hardware. Goddard Space Flight Center, Wallops Flight Facility and White Sands Complex also share STARS responsibilities along with other NASA centers.

"After the eight flight tests that make up Flight Demonstration 1 are complete, we will release a report. We will use the results to help us define some goals for Flight Demonstration 2 (FD2)," said Valencia.

"FD2 is a series of five flight tests scheduled to take place September 2004. We are also planning to fly our STARS package on a hypersonic vehicle in 2006."

NGLT combines previous Space Launch Initiative research and development efforts with cutting-edge, advanced space-transportation programs to increase the safety, reliability and cost-effectiveness associated with developing the nation's next-generation reusable launch vehicle.

Federal agencies convene at KSC for research

Near a lagoon just south of Pad 39A, Dr. Grant Gilmore of Dynamac listens intently to the sound of snapping shrimp from the speakers of a laptop computer.

"It's one of the fastest movements made by any animal," notes Dr. Gilmore. "They open and close their claws so fast that it breaks the water molecules apart, and that's what the snapping sound is."

Dr. Gilmore is one of more than a dozen researchers participating in the Joint Environmental Science Investigation (JESI) at Kennedy Space Center. The program has brought together millions of dollars in underwater research equipment in one small stretch of Banana River north of the NASA Causeway.

Organizations involved in the work include the Autonomous Undersea Vehicles Division of

the Navy, the Florida Fish and Wildlife Commission and the Center for Ocean Technology.

"We have an incredible amount of endangered and threatened species in this area, because of the wildlife refuge,"

said Justin Manley, ocean engineer with the National Oceanic and Atmospheric Administration. "We also have an excellent center of technology

(See **FEDERAL**, Page 7)

Atlas V chosen to launch Pluto mission

NASA has chosen the Atlas V expendable launch vehicle provided by Lockheed Martin Commercial Launch Services as the launch system for the proposed Pluto New Horizons mission. The mission is scheduled for launch to Pluto in January 2006.

As proposed, the mission is a scientific investigation to obtain the first reconnaissance of Pluto-Charon, a binary planet system. New Horizons would seek to answer key scientific questions regarding the surfaces, atmospheres, interiors and space environments of Pluto and

Charon using imaging, visible and infrared spectral mapping, ultraviolet spectroscopy, radio science and plasma sensors.

The principal investigator is Dr. Alan Stern of the Southwest Research Institute, Boulder, Colo., while the implementing institution is the Applied Physics Laboratory of Johns Hopkins University, Laurel, Md.

The proposed mission would use a spacecraft supplied Star 48B-based third stage, manufactured by The Boeing Company of Huntington Beach, Calif., to achieve the required mission performance.



More than a dozen researchers are participating in the Joint Environmental Science Investigation (JESI) at Kennedy Space Center. The program has brought together millions of dollars in underwater research equipment in one small stretch of the Banana River north of the NASA Causeway.

Texas family recalls recovery contributions

A tragedy sometimes brings out the best in humanity. And when the tragedy occurs in your own 'backyard,' the experience can be life-altering. That was the feeling relayed to workers at Kennedy Space Center by Roger and Belinda Gay of Hemphill, Texas, while they recently toured the Center.

The morning of Feb. 1 of this year started off like any other day for the small-town couple. But things changed quickly when Belinda, on her way to a baby shower, received a call from her husband, Roger, requesting her to return home and meet him at the local Veterans of Foreign Wars (VFW) Hall.

Gay, who is commander of the local VFW chapter, had received a request to open the hall for use as a central location for the Columbia recovery workers who would soon be descending upon their area.

Belinda, who is president of the VFW Ladies' Auxiliary, rushed back to help coordinate the efforts with the Red Cross and local volunteers. She's not quite sure how they did it, but somehow an average of 3,000 people were fed each day at the VFW Hall for several weeks.

According to Belinda, volunteers worked around the clock in shifts to prepare the food and serve it to hungry and



From left: Roger Gay, son Chad, daughter Andrea, wife Belinda and Belinda's cousin Milt Watts, tour the Columbia Debris Hangar during their Aug. 12 visit.

weary recovery workers for at least four weeks before NASA made other arrangements.

"It started out like we were feeding the masses with only two loaves of bread and a basket of fish," said Belinda. "I can't explain it except to say that we witnessed a miracle in action."

Hemphill, a town of approximately 1,100 people, is a close-knit community with "huge hearts," according to Belinda. "People donated money, brought food every day and donated their time to work at the VFW Hall without hesitation," said Belinda.

"Our community felt like the astronauts' mission became our mission, a mission of returning home...a completion of the mission."

Residents joined the searchers in the field, walking side-by-side with U.S. Forest Service other agency workers, and the NASA team. Belinda, drawn to the search efforts and the people, joined in the first few days.

She walked through fields filled with briar patches, forest land with many obstacles and difficult terrain, helping to search for even the smallest pieces of debris. According to the Gay family, a bond was formed between the searchers and the Hemphill community.

So, many weeks after recovery efforts had ceased and searchers had returned home, the Gays, along with their son Chad, daughter Andrea, cousin

Matt, and other relatives and friends, traveled to KSC. They came to see where orbiters are processed and launched, and to meet the workers.

While touring the Orbiter Processing Facility, Andrea said, "I had no idea how much went into it all. Actually seeing the tiles and how light they are was amazing."

Columbia's nose cone and all seven crewmembers were recovered at or near Hemphill.

The community plans to build a memorial site to honor the memory of the seven crew members, the Columbia vehicle and all its missions, the two recovery workers who also lost their lives and all the volunteers.

The memorial will include a museum, an education resource center and a nature trail that leads to the recovery site.

The town has contracted with Texas A&M University to develop some museum and trail designs for their Columbia Memorial Committee. "We want it to be a peaceful experience for all who come here," said Belinda.

Inside the Columbia Reconstruction Hangar, she commented, "We needed to come here. Seeing the hangar was a very emotional experience and gave us some sense of closure."

Space Club helps fund Brevard Space Week

The National Space Club Florida Committee's August luncheon featured Brevard County School Board Superintendent Richard DiPatri, who updated guests on the status of 81 local schools and how they compare to others in the state.

DiPatri also accepted a \$10,000 donation from the club to help defray costs for Brevard Space Week scheduled for Nov. 17-21.

During those five days, all 5,540 Brevard sixth-graders and their teachers will have an opportunity to visit Kennedy Space Center for a full day to learn about the space program. KSC will furnish tour buses to

transport students from school to the Center.

Other sponsors for Brevard Space Week include Boeing (\$20,000), United Space Alliance (\$3,000) and Computer Sciences Raytheon (\$500). More sponsors are needed – contact Lynn Clifton with The Brevard Schools Foundation at 633-1000, ext. 796 to help out.

All students participating will be given a family pass for a future KSC visit. Most of the teachers visited KSC Aug. 25 for training sessions about how to prepare their students for the visit, as well as how to follow up with them afterward.

The teachers also enjoyed



Brevard County sixth-grade teachers visited KSC Aug. 25 for training sessions about how to prepare their students for the visit, as well as how to follow up with them afterward.

lunch with astronaut Jerry Carr.

The Sept. 9 annual business meeting of the National Space

Club will feature KSC Director Jim Kennedy. Call (321) 917-9192 for reservations.

Crawler 2 undergoes major upgrades

Crawler-transporter (CT) 2 recently underwent modifications to the cab and exhaust system. The CT moves Space Shuttle vehicles, situated on the Mobile Launch Platform (MLP), between the VAB and launch pad.

Moving on four double-tracked crawlers, the CT uses a laser guidance system and a leveling system for the journey that keeps the top of a Space Shuttle vertical within plus- or minus-10 minutes of arc. Unloaded, the CT weighs 6 million pounds.

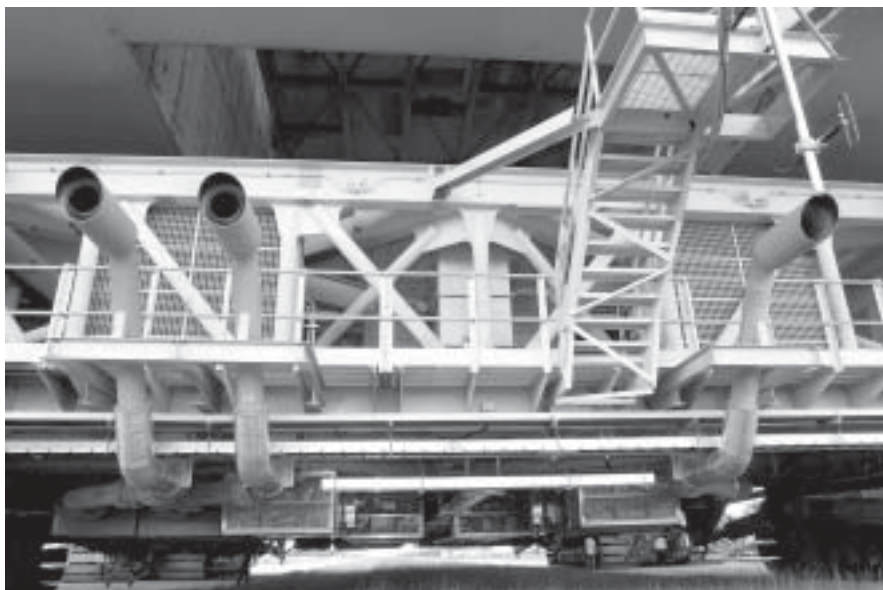
Seen on top of the MLP are two tail service masts that support the fluid, gas and electrical requirements of the orbiter's liquid oxygen and liquid hydrogen aft umbilicals.

Below: Inside the cab of crawler-transporter (CT) 2, driver Sam Dove, with United Space Alliance, operates the vehicle on a test run to the launch pad.

Middle right: A closeup of CT 2 shows the cab (left, above the tracks) that recently underwent modifications.



Bottom right: The new muffler system on the vehicle.



Japanese students join Brevard counterparts at KSC

Japanese students who performed STS-107 experiments encountered similar outstanding American high school students, honored the Columbia crew and much more at NASA-Kennedy Space Center Aug. 19-20.

NASA-KSC's National Space Development Agency of Japan (NASDA) resident and International Space Station offices worked with KSC Education Programs and University Research to coordinate this learning and mourning opportunity.

"At completion of STS-107's mission, NASDA was to award the high school with the best experiment result a visit to KSC and Spacehab. Despite the inability to retrieve the crystal protein experiment samples, NASDA agreed to award the Urawa Daiichi Girls High School (Saitama, Japan) with the trip to Florida to encourage continued interest in space," explained



The Urawa Daiichi Girls High School group joined students from Eau Gallie High School and Jacksonville-area high schools recently at KSC.

Education Program Manager Patricia Gillis.

NASDA resident office representative, Shimpei Takahashi, explained NASDA's goals for the visit. "We would like the students to make a friendly relationship with Americans for their future, and to

share what they learned, to remain interested in space," he said. "We would like them to remember this precious experience and to build confidence with their great achievement."

A few students from Eau Gallie (Melbourne, Fla.), Terry Parker and Stanton College

Preparatory high schools (both in Jacksonville, Fla.) met with the visiting Urawa Daiichi Girls High School high-achievers to share their experiment experiences.

The outstanding students explained their research to their fellow students and educators at the Spacehab Conference Room. They used this meeting as an opportunity to learn from each other via a questions and answers session. While at KSC, the group also toured key Center facilities and enjoyed the KSC Visitor Complex.

The future scientists honored the crew that cared for their hard work on-board Columbia with a floral tribute at the STS-107 Memorial Stone at Spacehab. Takahashi explained that the tribute's objectives are "to appreciate their great achievement for their experiments and humankind."



Key officials are poised to cut the ribbon officially dedicating the new security gates on Kennedy Parkway (Gate 2) and NASA Parkway (Gate 3). From left are Wally Schroeder, with Jones, Edmunds & Associates; Bobby Porter, with Oneida Construction; Daniel Tweed, NASA project manager; Jim Kennedy, center director; and William Sample, SGS deputy program manager. "What an honor it is to have this beautiful facility and its sister facility, and to have our outstanding security service do their thing for this Center," Kennedy said. "We appreciate the security and all you do for us. To the people who made this facility possible, you did a great job." The two new security gates were activated Aug. 1, as scheduled.

ONE NASA . . .

(Continued from Page 1)

Management Agenda (PMA) goal to make government more efficient and effective, is known as One NASA.

Following the prior introduction of One NASA concepts, the need for workshops was overwhelmingly expressed in One NASA surveys. Employees sought to better understand the overall strategy and direction of the Agency while grappling with their role in that strategy.

The resulting session objectives are to provide an overview of the strategy for the Agency; outline accomplishments and future plans for enterprises and

centers; highlight how all centers contribute to enterprise plans and Agency vision and mission; provide examples of collaboration among enterprises and centers through real life examples; and share information about various initiatives.

One of the 38 One NASA actions was to broaden employee's knowledge of the Agency's vision and the initiative, so in response NASA-KSC was selected to host the initiative's first leader-led workshops, which opened at the KSC Visitor Complex IMAX Theater. NASA leaders discussed how the Agency vision relates to all employees' work objectives.

Kennedy; James Jennings, NASA's associate deputy administrator for Institutions and Asset Management; Ed Weiler, associate administrator for Space Science; Kevin Peterson, Dryden Flight Research Center director; incoming KSC Deputy Director Woodrow Whitlow; and implementation team lead Johnny Stephenson each explained how their respective centers contribute to One NASA.

Stephenson emphasized, "One NASA allows us to accomplish more as a team than ever possible individually."

Breakout sessions provided detailed information about the progress of NASA's ongoing

Super Safety & Health Day

The Cape Canaveral Spaceport will participate in a full day of activities October 15 as part of Spaceport Super Safety & Health Day. This event was initiated in 1998 to increase awareness of the importance of safety and health among the government and contractor work force. This year's theme is "Safety & Health, Lifeline to your Future."

initiatives. Specifically, the gatherings focused on (1) project management; (2) return to flight; (3) PMA/Full Cost; (4) human capital/NASA Shared Services Center; and (5) integrated planning.

Also, these workshops introduced key leaders outside of individuals' own enterprises while simultaneously emphasizing the level of cross-center collaboration under way within NASA.

For example, Weiler shared his knowledge of astronomy to explain to KSC's work force that thinking out of the box may be difficult but often yields amazing results.

Why we send people to space

By N. Wayne Hale, acting deputy director of the Space Shuttle program

Editor's Note: Hale recently returned to the Johnson Space Center from KSC where he served as manager of launch integration.

To the Space Shuttle Team:

This is probably a good time to remember what we are about and why we do it.

We are in the business of sending people into space - nothing more and nothing less. Actually, there is quite a bit more, but certainly nothing less.

Is this a worthwhile activity? Why should our nation devote a portion of the national treasure to this goal? Why, in the face of certain danger, recent failure, recurring disappointment and repeated death should this nation consider continuing to send people into space?

I believe there are four major reasons to continue.

First of all, NASA is an instrument of national policy. The United States determined to send people into space, even to the moon, as a demonstration of national will and of national capability.

In the depth of the cold war, the race to put a man on the moon became an alternative to war between two competing ideologies and two competing nations.

In the end, the cost and the psychological disadvantage suffered by the loser helped to

end the cold war. Today, times and policies have changed; our old adversaries are our new partners. But the act of sending our people into space is still an instrument of national policy.

We have certainly bound ourselves and other nations more closely together by working on a common goal. Building the International Space Station is the most complex international engineering accomplishment in the history of the world. We remain an instrument of national policy.

Second, byproducts of developing space technology have improved the quality of life in our world. Many useful, helpful and even lifesaving devices, techniques and technologies originated or were refined by the effort to explore space.

NASA annually publishes a volume of spin-off technologies and devices. Even when we attempt to use commercial-off-the-shelf, it seems that we require improvements and changes that help push technology along.

Over a decade ago a study showed that every dollar spent on NASA resulted in \$7 of new productivity for our nation. Keeping our nation on the forefront of world technology and thus ensuring jobs and a better life for our citizens is part of our legacy.

Third, exploring space advances science. Contrasted to technological improvements, pure science helps us to under-



At the KSC Shuttle Landing Facility Wayne Hale (left), acting deputy manager of the Space Shuttle program, greets Ret. Navy Admiral Harold W. Gehman Jr., chairman of the Columbia Accident Board, after his arrival.

stand our place in the universe and how the forces that shape our world work. The exploration of the moon has helped us understand plate tectonics and ecological results of catastrophic impacts.

Exploring space has helped us understand the nature of the sun, how planetary atmospheres work, and more. Perennially, all my neighbors ask how can we better predict hurricanes. Without a doubt, the knowledge we have learned from space flight has provided the most substantial improvement in that art in the last century.

Will we find the cure for cancer or even the common cold in space? Maybe. But will our discoveries contribute to the eventual end of those scourges? Certainly.

Finally, space exploration - like all exploration - is about the

human spirit. What is over the next hill? To inspire our young people and motivate our nation, the only objective is up.

The new version of manifest destiny is to explore the universe. We go into space not merely because it helps us economically, or fosters building new and improved gadgets; we go into space because that experience fulfills the nature of what it means to be human.

Enabling human hands to reach out and touch the universe is a goal worthy of the danger and sacrifice that human space flight has required.

We have certainly endured trials this year and we can expect more ahead of us.

As we go into the next few days, I would offer these words of the great baseball player 'Babe' Ruth: "It's hard to beat a person who never gives up."

FEDERAL . . . (Continued from Page 3)

here with the Kennedy Space Center."

The program was designed not only to gain a volume of scientific knowledge about the estuary, but also to bring together multiple government agencies and private sector research firms in unprecedented collaboration.

"We've got two goals: programmatically, to prove that this kind of cooperation is possible,

and scientifically, to see how these technologies can work together," said Manley.

The equipment being tested includes underwater sensors, such as the Passive Acoustic Monitoring System developed by NASA's Jet Propulsion Laboratory, and active systems, such as the Remote Environmental Monitoring Units, or REMUS, a modified torpedo being used by the Navy to cruise under the surface and collect a variety of environmental data.

The applications of the

research taking place are as varied as the agencies participating.

Dr. Gilmore is one of the world's foremost authorities on the sounds made by fish. He hopes that the technologies being tested in the river can help determine the cause and effect of events such as rocket launches on the activity of the marine life.

"If we don't know anything about spawning, we wouldn't know anything about the future of the fisheries," said Dr. Gilmore.

The Department of Homeland Security and the Navy are also interested in the results of the collaboration taking place. Underwater acoustic sensors could be used in a variety of applications across the U.S. to monitor sensitive areas.

Joe Bartoszek, NASA Spaceport manager at KSC, already sees the research as a success: "We've developed a great amount of teamwork, and at the same time, we're gaining a volume of environmental knowledge about this area."

Remembering Our Heritage

40 years ago: Syncom II sees one-third of earth

On July 26, 1963, a Delta-Thor with a height of 90 feet lifted off from Cape Canaveral on a mission that would be one of the most significant achievements of the NASA space program.

Five and a half hours after launch, a 1,000 lb. thrust solid motor carried on board the satellite was fired at an altitude of 22,548 miles to make the orbit path circular so that its period would be synchronous with earth rotation (24 hours).

The firing of the motor was actually photographed by a camera of the Smithsonian Astrophysical Observatory in South Africa showing a plume of gases 66 miles long and 33 miles wide. Syncom II carried transponders and thus became a communications relay station in space that could see more than a third of the earth yet appear to be fixed above a point on the earth below it.

The satellite used an active repeater communication system designed to handle one two-way telephone or 16 teletype channels.

"Syncom II was not intended to achieve geostationary orbit, but had to settle for geosynchronous, the same period of rotation as the earth, but with some inclination,"

said John Neilon, a member of the launch team.

"This did not preclude it from carrying out its mission. Even though we were delighted with our launch record, we knew it couldn't go on forever. The countdown on July 25 proceeded in an orderly fashion until T-4 minutes when excessive drift in the yaw gyro of the booster caused a 24-hour scrub. Launch finally occurred at 9:33 a.m. on July 26."

Velocity control was provided by nitrogen and hydrogen peroxide gas systems. At synchronous altitude, the spacecraft was in sunlight 99 percent of the time, so no active temperature control system was needed and fewer batteries were required.

This was the 19th consecutive successful Delta launch from Cape Canaveral. The Delta launch vehicle was developed and prepared for flight by McDonnell-Douglas personnel.

Four days later, a hydrogen peroxide jet was fired to align the satellite's antenna so that its radiating beam always contacted the earth and to increase the westward drift rate. After two weeks of drifting, Syncom II approached its intended location over Brazil, and its nitrogen jets were pulsed in a series of four firings to slow the spacecraft to near-zero drift on Aug. 16.



Syncom II was the 19th consecutive successful Delta launch from Cape Canaveral. The satellite provided worldwide TV and telephone service.

Voice, teletype, fax and data transmission tests were successfully conducted between the Lakehurst, N.J., ground station and the terminal on board the *USNS Kingsport* while the ship was off the coast of Africa.

It wasn't long before this technology was utilized, and instant worldwide TV and

telephone service was available, as well as observations of worldwide weather. The launch was managed by the Goddard Launch Operations team that, two years later, became KSC Unmanned Launch Operations. By Oct. 1965, KSC had management responsibility for all NASA launch operations at the Cape.

Annual Intercenter Walk/Run scheduled

The KSC Fitness Center is sponsoring the Intercenter Walk/Run on Tuesday, Sept. 16 at the Shuttle Landing Facility. The two-mile walk/run, 5K run and 10K run are free for all Spaceport employees and is a great way to have some friendly competition with your co-workers.



Stop by either fitness center before Sept. 12 to pre-register. Late registration takes place at the race and T-shirts may be ordered at any NASA Exchange store.

The order deadline is Friday, Sept. 5 and the pick up date for shirts is Sept. 15. Please arrive 45 minutes before race time to park and check in. If you are interested in being a volunteer for the walk/run, please call 867-7829 or e-mail Debra Orringer at orrindl@kscems.ksc.nasa.gov.



John F. Kennedy Space Center

Spaceport News

Spaceport News is an official publication of the Kennedy Space Center and is published on alternate Fridays by External Relations and Business Development in the interest of KSC civil service and contractor employees.

Contributions are welcome and should be submitted two weeks before publication to the Media Services Branch, XA-E1. E-mail submissions can be sent to Jeffery.Stuckey-1@ksc.nasa.gov.

Managing editor. Bruce Buckingham
Editor. Jeff Stuckey

Editorial support provided by InDyne, Inc. Writers Group.
NASA at KSC is located on the Internet at <http://www.ksc.nasa.gov>

USGPO: 733-133/600039